

REMARKS

Claims 1-79 are pending.

In the *Official Action* of December 28, 2010, Claims 29-49, 71-77 and 79 were withdrawn from further consideration as drawn to non-elected inventions. Applicant hereby confirms its earlier election of claims and species and requests rejoinder of the withdrawn claims for the reasons discussed herein.

Claims 8 and 22 were rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, Claim 8 recites “wherein the second intermediate layer is the same as said intermediate layer”. Clarification was requested as to what feature of the second intermediate layer is the same as for the intermediate layer. Claim 22 recites “wherein said film has a peel strength of greater than 1.0 lbsf/in”. Clarification was requested as to what the film is being peeled *from*.

Claims 1-15, 18-21, 23-25, 50-63, 65-67, 70 and 78 were rejected under 35 USC §102(b) as being anticipated by *Saavedra et al.*, WO 2004/024433, United States Patent Application Publication No. 2006/0057410 (hereinafter referred to as *Saavedra*) and evidentiary references “Butadiene” Sun, H.N. and Wristers, J.P. , “ Butadiene” Kirk-Othmer Encyclopedia of Chemical Technology, Matweb data sheet for Chevron Phillips K-resin® DK 11 Styrene Butadiene copolymer and *Wolf et al.*, United States Patent No. 6,406,763. Claims 16, 17, 22, 26-28, 64, 68 and 69 were also rejected as obvious over *Saavedra*, with secondary references being cited with respect to Claims 16, 17.

As amended, this application is believed in condition for allowance. Claims 8 and 22 have been amended to address the clarity issues raised by the Examiner. Support for the amendment to Claim 8 is found in the application as filed, page 23, first full paragraph, where it is believed apparent that “same” refers to the material from which the intermediate layers are formed:

The film (20) may also include an intermediate layer (30) disposed between the first and second layers (24, 26), and/or between the second and third layers (26, 28) as shown in **Figures 2** through **4**. If included, the intermediate layer (30) may include, but is not limited to, nylons, ethyl vinyl alcohol, polyolefins including, but not limited to polyethylene and polypropylene, polyester, paper, and combinations thereof. The film (20) may also include a second intermediate layer (32) disposed between the second and third layers (26, 28), as shown in **Figure 4**. If the second intermediate layer (32) is included, the second intermediate layer (32) is preferably the same as the intermediate layer (30). In scenarios where certain intermediate layers (30, 32) are utilized, tie layers may be necessary. If the film (20) does not have any tie layers, the film (20) can be manufactured at a lower cost and with fewer raw materials.

Support for the amendment to Claim 22 with respect to peel strength is found at page 6 of the application s filed, lines 23-30:

...The styrene-butadiene layers are preferably melt-bonded to the cyclo-olefin layer by means of co-extrusion, but the layers may also be bonded by lamination. In still other embodiments, the cyclo-olefin layer is thinner than the SBC layer. A typical structure might include a layered composite of the structure: 125µm SBC/ 50µm COP layer/125µm SBC to provide suitable packaging properties. In the films of the present invention, the bonded layers of styrene-butadiene and cycloolefin typically exhibit a peel adhesion value of at least about 0.5 lbf/in. More preferably, the layers exhibit a peel adhesion of at least about 1.0 lbf/in.....

The independent claims have also been amended to specify the patentable combination wherein the claimed structures and methods of making them include a cycloolefin layer and a styrene-butadiene block copolymer layer which is at least 50 wt.% styrene, from about 5 to about 50 wt.% butadiene and optionally 10% other polymeric components. These common features further distinguish all claims from the prior art and *Unity of Invention* exists as to all of the amended claims because of this common special technical feature as provided in PCT Rule 13. Support for the amendments to the independent claims is found in the application as filed, page 6, lines 8-15:

The styrene-butadiene layer may consist essentially of at least about 50 wt. % styrene, about 5 to about 50 wt. % butadiene, and optionally up to 10 % other polymeric components. A preferred styrene-butadiene copolymer consists of the residue of styrene and butadiene. A typical range for styrene content is from

about 60 to about 90 weight percent and a typical range for butadiene content is from about 10 to about 40 weight percent. More preferably, the styrene content is present in an amount from about 70 to about 80 weight percent and the butadiene is present in an amount from about 20 to about 30 weight percent.

as well as on page 7, lines 14-24:

Also provided in accordance with the present invention is a method for making a multilayer film by co-extruding a styrene-butadiene block copolymer layer and a cyclo-olefin layer, such that the styrene-butadiene layer is directly melt-bonded to the cyclo-olefin layer. Here again, the styrene-butadiene layer preferably consists essentially of at least about 50 weight percent styrene, about 5 to about 50 weight percent butadiene, and optionally up to 10 weight percent of other polymerized components. The cyclo-olefin layer may also consist essentially of a cyclo-olefin copolymer. Typically, the cyclo-olefin is extruded at a polymer exit temperature of about 255°C to about 275°C and the styrene-butadiene layer is extruded at a polymer exit temperature of about 210°C to about 230°C.

The present invention film provides superior packaging properties as noted in the application as filed, page 7, line 6 and following to page 8, line 5:

The film of the present invention can be used in packaging as an effective dust and/or moisture barrier. Using styrene butadiene copolymer in the first and third layers of the film allows the film to be substantially transparent, have superior optical properties, and be impact resistant and durable. Using the styrene butadiene copolymer also allows the film to be efficiently processed, have a pleasing tactile feel, and be thermoformable at low temperatures resulting in a low cost of producing the film. The film provides a 35% film yield advantage compared to competitive halogen-containing films due to a low density of the styrene butadiene copolymer. A higher quantity of the film of the subject invention can be purchased at the same weight as a comparative film because of the low density of the styrene butadiene copolymer.

A salient feature of the invention is that the films and packaging of the invention provide excellent moisture barrier and can replace structures made from halogenated materials which are considered undesirable from an environmental/disposal perspective. Compare the barrier

properties in Table 3 (invention) with the properties of structures made with chlorinated and fluorinated polymers (Table 5):

Table 3 (Invention)

Physical Properties of Film	Test Method (ASTM)	Units	Example 6 Film	Example 7 Film	Example 8 Film
Thickness	N/A	μm	300	300	300
Density	N/A	g/cm^3	1.02	1.02	1.02
Water Vapor Transmission Rate	F-1249	$\text{g/m}^2/24 \text{ hrs.}$	0.31	0.32	0.28
Light Transmission	D-1003	%	93	93	93
Haze	D-1003	%	2.2	2.9	2.4
Peel Strength	D-903	lbs./in.	1.72	1.62	0.74
Peak Peel Strength	D-903	lbs./in.	1.89	1.69	0.80
Yield	N/A	m^2/kg	~ 3.20	~ 3.20	~ 3.20

Table 5

Physical Properties of the Film	Test Method (ASTM)	Units	Comparative Example 14 Film	Comparative Example 15 Film	Comparative Example 16 Film
Thickness	N/A	μm	~ 280	~ 302.2	~ 264.2
Density	N/A	g/cm^3	1.38	N/A	N/A
Water Vapor Transmission Rate	F-1249	$\text{g/m}^2/24 \text{ hrs.}$	2.85	0.30	0.39
Light Transmission	D-1003	%	93	~ 90	~ 90
Haze	D-1003	%	1.2	N/A	N/A
Peel Strength	D-903	lbs./in.	> 1.5	> 1.5	> 1.5
Yield	N/A	m^2/kg	~ 2.87	~ 2.17	~ 2.5

Moreover, the present invention provides unexpected advantages, including surprising peel strength and the fact that tie layers are not required; *see* the application as filed, p. 22, lines 20-31:

The films made in accordance with the present invention have the unexpected advantage of superior interlayer adhesion without the aid of an adhesive or tie layer. The absence of a tie layer is advantageous for several reasons. The multilayer film is easier to produce without the additional cost of adhesive or tie material and associated equipment. Tie layers may also impart detrimental optical properties to the film. Furthermore, the absence of a tie layer enables manufacturers with lower extrusion capacity to produce multilayered films in accordance with the present invention. For example, equipment with a maximum extrusion capacity of three layers would be able to produce a three layer SBC/COP/SBC film of the present invention, because no extruder capacity is utilized on the production of a tie layer. The films exhibit a surprisingly high peel adhesion value.

Regarding *Saavedra*, it is noted that this reference relates to shrink film and is not at all suggestive of the more specific combinations of the amended claims. In this regard, disclosure relating to films potentially including cyclo-olefin components and styrene-butadiene components appears on page 3 of *Saavedra*, lines 9-27 (WO version):

In another preferred embodiment, the invention is a process for preparing a film having at least 3 layers, the process comprising the step of coextruding, via a hot-blown film process, a film comprising at least one inner layer between two skin layers, wherein: (a) the inner layer, or layers, comprises at least one stiffening polymer selected from the group consisting of low density polyethylene, linear low density polyethylene, high density polyethylene, blends thereof, polypropylene homopolymer, polypropylene random copolymer, styrene/butadiene copolymer, polystyrene, ethylene-vinyl acetate copolymer and cyclic-olefin copolymer, provided that when more than one inner layer is present, the inner layers can be the same or different; and, (b) the skin layers, which may be the same or different, comprise at least one of low density polyethylene; a blend of low density polyethylene and linear low density polyethylene; a blend of low density polyethylene and very low density polyethylene; polystyrene; ethylene-vinyl acetate copolymer; a blend of ethylene-vinyl acetate copolymer and linear low density polyethylene; cyclic-olefin copolymer; styrene-butadiene copolymer; or, polypropylene random copolymer, provided that the skin layers are devoid of a homogeneously branched polyethylene resin prepared with a single site catalyst; and (c) the film has a haze value of less than about 15%, a 2% secant modulus greater than about 50,000 psi and a cross-directional shrinkage

greater than 0%, with the proviso that the hot-blown film process does not comprise double- bubble or tenter-frame orientation processes.

It will be appreciated from the foregoing that the reference merely states that components may be included in a layer but does not disclose, teach or suggest the claimed subject matter of this case. Indeed, the reference teaches away from Claim 1 and the other independent claims reciting that the styrene-butadiene layer is substantially free of cycloolefin and the cycloolefin layer is substantially free of styrene-butadiene because the reference teaches the presence of *both* in adjacent layers. Furthermore, no examples of a cycloolefin/styrene butadiene containing film are provided. *Saavedra* shows on page 12 cycloolefin layers adjacent LDPE layers, Examples 8,10:

Table II: 5-layer high clarity, high stiffness film results

							Shrink	Shrink	Shrinkage	Shrinkage
Example No.	A=Skin/% of total thickness	B=Inner/% of total thickness	C=Core/% of total thickness	BUR	Haze	2% Secant Modulus	Tension 150C (MD)	Tension 150C (CD)	Shrinkage % 150°C Avg. (MD)	Shrinkage % 150°C CD Avg. (CD)
5	LDPE 5011/10%	LDPE 136S/20%	HDPE DEGD 1059/40%	2.5	10.67	62058	16.4	very low	79.8	14.4
CS L	LDPE 5011/10%	LDPE 136S/20%	PP DS 6D82/40%	2.5	7.50	45939	18.4	very low	81.05	29.1
6	PP DS 4D05/10 %	LDPE 136S/30%	PP DS 4D05/20%	3.6	4.54	62438	23.6	very low	81.8	54.7
7	PP DS 6D82/10 %	LDPE 6621/30%	PP DS 6D82/20%	3.6	7.86	53565	20.0	very low	82.05	38.7
8	PP DS 6D82/10 %	LDPE 136S/30%	Topas 8007/20%	3.6	7.99	136365	25.4	13.6	73.9	40.7
9	PP DS 6D82/10 %	LDPE 136S/30%	K-resin/ 20%	3.6	6.75	59412	23.8	8.5	72.9	51.3
10	PP DS 6D82/10 %	LDPE 136S/30%	Topas 8007/20%	3.6	6.77	127784	24.9	13.2	75.15	41.6

No suggestion of the claimed subject matter of is found, nor are the unexpected features discussed above even remotely suggested.

Turning to the restrictions made, withdrawal of the unity of invention objection is respectfully requested in view of the foregoing amendments. Under international practice, unity of invention exists when the claimed subject matter is directed to the same general inventive concept and the claims are linked by special technical features common to the various claims.

There is no distinction under international rules between product claims and process claims as there is in United States practice. *PCT Rule 13* governs:

Rule 13

Unity of Invention

13.1 Requirement

The international application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention").

13.2 Circumstances in Which the Requirement of Unity of Invention Is to Be Considered Fulfilled

Where a group of inventions is claimed in one and the same international application, the requirement of unity of invention referred to in Rule 13.1 shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" shall mean those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art.

13.3 Determination of Unity of Invention Not Affected Manner of Claiming

The determination whether a group of inventions is so linked as to form a single general inventive concept shall be made without regard to whether the inventions are claimed in separate claims or as alternatives within a single claim.

By way of the foregoing amendments, the styrene-butadiene layer recited in the independent claims has been further specified --with the further proviso that each styrene-butadiene block copolymer layer consists essentially of (i) at least about 50 wt. % styrene residue; and (ii) from about 5 to about 50 wt. % butadiene residue; and (iii) optionally up to 10 wt. % other polymeric components-- to distinguish the art and provide a common special technical feature to the various claims. Rejoinder is accordingly requested with respect to all of the withdrawn claims.

In view of the above Amendments and Remarks, this application is believed in condition for allowance. If for any reason the Examiner would like to discuss this case, the Examiner is invited to call at the number listed below.

Respectfully submitted,



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March 28, 2011